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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/932,639	08/17/2001	Neal G. Skinner	2000IP000227	6326

20558 7590 04/21/2003

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EXAMINER
SEDIGHIAN, REZA

ART UNIT	PAPER NUMBER
2633	67

DATE MAILED: 04/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/932,639	SKINNER NEAL G.	
	Examiner	Art Unit	
	M. R. Sedighian	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 February 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-13,19,20,25,27,28,30,39,40 and 44-61* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-13,19,20,25,27,28,30,39,40 and 44-61* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

1. This communication is responsive to applicant's 2/7/03 remarks in the application of Neal G. Skinner for "Multiplexed Distribution of Optical Power" filed 8/17/01. Claims 11-13, 19-20, 25, 27-28, 30, 39-40, and 44-61 are now pending.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 11-12, 25, and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Endo et al. (US patent No: 4,495,421) in view of Onaka et al. (US patent No: 6,351,323), or Gautheron (US patent No: 6,025,948).

Regarding claims 11, 25, and 27, Endo discloses a method of providing electrical power (col. 4, lines 65-67) to multiple power consuming devices (2-1, 2-2, fig. 4), comprising the steps of: interconnecting each of the power consuming devices (2-1, 2-2, fig. 4) to a fiber optic line (40, fig. 4), so that each of the power consuming devices is selectable for operation thereof by transmitting one of multiple optical wavelength bands (λ1, λ2, λ3, fig. 4) through the fiber (col. 5, lines 24-32), wherein each of the transmitted optical wavelength bands (e.g. λ1) causes a respective one of the devices to be selected (e.g. 2-1, fig. 4), and wherein the transmitting step comprises simultaneously transmitting multiple ones of the optical wavelength bands (col. 5, lines 4-8), and the multiple wavelength bands being transmitted through the fiber by interconnecting a first optical coupler (11, fig. 4) to the fiber (40, fig. 4). Endo differs from the claimed invention in that Endo does not discloses the first optical coupler receiving separate

optical wavelength bands from multiple tunable filters. Onaka discloses an optical transmission system (fig. 2) that is comprised of a plurality of optical tunable filters (14, fig. 2) and an optical coupler (12, fig. 2). Likewise, Gautheron teaches an optical transmission system (50, 51, fig. 1) that is comprised of a plurality of optical tunable filters (60, 52, fig. 2) and an optical coupler (35, fig. 1). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate a plurality of tunable optical filters and a coupler such as the ones of Onaka, or Gautheron for the optical couplers in the optical transmission system of Endo in order to selectively pass a desired wavelength along the transmission path to provide a plurality of different optical communication channels. Furthermore, incorporating tunable optical filters along different transmission paths to pass a desired signal, or to filter-out particular spectral portions of the light signals is well known in the field of optical communication. As to claim 25, Endo further discloses multiple control modules (30-1, 30-2, fig. 4) each of the control modules being operative to select the respective power consuming device (col. 5, lines 15-31), wherein the multiple optical wavelength bands being transmitted singly through the fiber optic line (note that fiber 40 carry a single multiplex signal).

Regarding claims 12 and 28, Onaka further discloses tunable filters (14, fig. 2) that are interconnected between a first optical coupler (18, fig. 2) and a second optical coupler (12, fig. 2).

4. Claims 13 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Endo (US patent No: 4,495,421) in view of Wu et al. (US patent No: 5,502,783).

Regarding claim 13 and 30, Endo discloses a method of providing electrical power to multiple power consuming devices as discussed above in claims 11 and 25. Endo discloses a plurality of optical signals Sp1, Sp2, and Sp3 of respective wavelengths λ1, λ2, and λ3 that are produced and transmitted via an optical fiber 40 (col. 5, lines 3-10). Endo differs from the claimed invention in that Endo does not specifically disclose respective multiple tunable lasers for producing the optical signals. Wu discloses a plurality of multiple tunable lasers (col. 3, lines 55-60 and 12, fig. 1). Therefore, it would have been obvious an artisan at the time of invention to provide a plurality of respective tunable lasers such as the ones of Wu for the generation of optical signals in the transmission system of Endo in order to transmit a plurality of different optical signals and to enhance the flexibility of the system.

5. Claims 19-20 and 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Endo (US patent No: 4,495,421) in view of Mori et al. (US patent No: 5,677,781).

Regarding claims 19-20 and 39-40, Endo discloses a method of providing electrical power to multiple electronic devices as discussed above in claims 11 and 25. Endo differs from the claimed invention in that Endo does not specifically disclose the electronic devices are data storage devices, or devices with programmed functions. Endo teaches an electrical appliance includes various electric loads such as motors, solenoid, air-conditioning heater, etc (col. 2, lines 31-38). It would have been obvious that such electrical appliances can be provided with electronic circuitries to store data, or they can be provided with installed programs to perform different functions. Furthermore, Mori discloses an optical transmission system (fig. 1), wherein optical signals are transmitted (λ1, λ2, λ3, fig. 1) and at the receiving end the optical signals are

filtered (8a, 8b, 8c, fig. 1) and received by power measurement instruments (col. 7, lines 57-60 and 9a, 9b, 9c, fig. 1). Mori further teaches a computer with an installed program is connected to the measurement means (col. 5, lines 62-67, col. 6, lines 6-9). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate respective power measurement means that are connected to computers or data storage devices such as the ones of Mori for the respective electronic units of Endo in order to retrieve and collect the transmitted information to further provide signal processing and measurements.

6. Claims 44, 48-49, 52-53, and 56-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Didden et al. (US patent No: 6,271,766).

Regarding claim 44, Didden discloses a well tool control system (20, fig. 1) for selectively supplying electrical power (col. 2, lines 48-55) to multiple electrical power consuming well tools (12, fig. 1) in a subterranean well (15, 52, 54, fig. 1), the system comprising: a fiber optic line extending in the well (col. 3, lines 29-32 and 10, fig. 1); and multiple control modules (12, fig. 1, note that each sensor provides a respective wavelength characteristics by reflecting and transmitting a portion of an incident light thereon, therefore, it can function as control module) interconnected to the fiber optic line (10, fig. 1), wherein each of the control modules (12, fig. 1) is responsive to one of multiple optical wavelength bands (a broadband light source in the transceiver 22 can provide a multiple optical wavelength band such as the incident light 14 that is launched along the fiber 10 and which is incident on each of the sensors 12, therefore, each sensor module is responsive to the optical wavelength band transmitted by the light source 14) transmitted through the fiber optical line (col. 4, lines 30-32).

Didden differs from the claimed invention in that Didden does not specifically disclose multiple opto-electric converters. Didden teaches a sensor may be de-selected, or inactivated or being "off", for example by not illuminating the sensor at its characteristic wavelength, or by not converting the optical signals from such sensor to electrical signals (col. 2, lines 48-54). Therefore, it would have been obvious to an artisan at the time of invention that each of the sensors in the measurement system of Didden has an optical to electrical conversion functionality in order to provide the sensor output data to a remote link or to a user for further signal processing or signal measurements.

Regarding claims 48-49, Didden discloses the multiple optical wavelength bands are transmitted singly or simultaneously through the fiber (col. 4, lines 40-48).

Regarding claim 52, Didden discloses optical coupling for the optical wavelength bands (col. 3, line 35, col. 4, lines 30-32).

Regarding claim 53, Didden discloses a tunable laser (col. 4, line 31-32, col. 7, lines 50-53).

Regarding claim 56, Didden discloses the electrical power is supplied to the selected well tools in a manner which transmits data in a selected one of digital or analog form (col. 5, lines 60-65).

Regarding claims 57-58, Didden discloses the well tools are data storage devices (col. 6, lines 41-50).

Regarding claims 59 and 61, Didden discloses there are multiple sensors interconnected in the fiber line (col. 3, lines 34-35).

Regarding claim 60, Didden discloses the sensor includes an intrinsic fiber Bragg grating (col. 3, lines 38-39, 43-67).

7. Claims 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Didden et al. (US patent No: 6,271,766) in view of Otani et al. (US patent No: 6,115,156).

Regarding claims 45-47, Didden differs from the claimed invention in that Didden does not disclose a WDM drop including an optical circulator and a Bragg grating interconnected between the fiber optic line and the respective well tool. Didden discloses a plurality of sensors that each may be similar to any fiber optic grating based sensor (col. 3, lines 38-39), and further discloses multiplexing techniques may be used to distinguish one sensor from another sensor, and the characteristic or reflection wavelength of the grating in each sensor may be different (col. 4, lines 41-48). Otani discloses a WDM demultiplexer (col. 4, lines 15-37 and 19, fig. 1) that includes an optical circulator (27, fig. 2) and a Bragg grating (28, fig. 2). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate a WDM demultiplexer that includes an optical circulator and a Bragg grating such as the one of Otani for each of the fiber optic grating based sensor of Didden in order to selectively pass or prevent the transmission of a specific wavelength band to respective sensors so that each sensor can measure one or more different parameters such as resistivity, pressure, or temperature.

8. Claim 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Didden et al. (US patent No: 6,271,766) in view of Chown (US patent No: 4,182,935).

Regarding claim 50, Didden differs from the claimed invention in that Didden does not

disclose multiple tunable filters and a first optical coupler interconnected to the fiber line. Chown discloses an optical fiber transmission system (fig. 5) that is comprised of a transmitter (11, fig. 2 and 20, fig. 5), a fiber line (13, figs. 2, 5), a first coupler (14, figs. 2, 5), a plurality of optical filters (col. 3, lines 16-20), and a plurality of optical sensors (16, fig. 2 and R, fig. 5). Therefore, it would have been obvious to an artisan at the time of invention to incorporate an optical coupler and filters such as the ones of Chown for the optical transmission system of Didden in order to selectively pass or prevent the transmission of a specific wavelength band to different sensors such that each sensor can measure one or more different parameters such as resistivity, pressure, or temperature.

Regarding claim 51, Chown further discloses tunable filters (col. 1, lines 52-54, col. 3, line 19 and figs. 5, 6) that are interconnected between a first optical coupler and a second optical coupler (branch couplers in fig. 6).

9. Claims 54-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Didden et al. (US patent No: 6,271,766) in view of Sichling (US patent No: 4,346,478).

Regarding claim 54, Didden differs from the claimed invention in that Didden does not disclose the opto-electric converter is connected to a switch. Sichling discloses a fiber optic sensor system (34, 36, 38, fig. 1) for transmission of information from one location to another (col. 2, lines 50-56), wherein the sensor system includes an opto-electric converter (34, figs. 1, 3) that is connected to a switch (70, fig. 3). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate a sensor system with opto-electric conversion circuitry and a switch such as the one of Sichling for the optical sensors in the

measurement system of Didden in order provide respective opto-electric conversion circuitries that can generate respective electrical signals that can be used for further signal processing or to measure different physical parameters such gas flow, pressure, or temperature.

Regarding claim 55, Sichling discloses the switch is a field effect transistor (col. 8, lines 9-10).

10. Applicant's arguments with respect to claims 11-13, 19-20, 25, 27-28, 30, and 39-40 have been considered but are moot in view of the new ground(s) of rejection.

11. Applicant's arguments filed 2/7/03 with respects to claim 44 have been fully considered but they are not persuasive.

Remark states Didden does not describe any electrical power distribution via selective wavelength transmission as recited in independent claim 44. However, the limitation selective wavelength transmission is not recited in claim 44. Claim 44 recites "... wherein each of the control modules is responsive to one of multiple optical wavelength bands transmitted through the fiber optic line to ...". Claim 44, recites the limitation of one of multiple wavelength bands transmitted through the fiber. Didden teaches an optical transceiver 22 that includes a broadband source (col. 4, lines 30-32) that provides an incident light 14. Didden further teaches if fiber lasers are used for certain of the sensors 12, each such sensor would provide a characteristic lasing wavelength $\lambda 1$, $\lambda 2$, $\lambda 3$, etc (col. 4, lines 22-24). Accordingly the optical transmission system of Didden is able to transmit one of a multiple wavelength band to each of the control modules, or sensors 12, or in another way, each of the control modules, or sensors 12 is responsive to one of a multiple optical wavelength band that is generated by the transceiver 22

and is transmitted through the fiber 10. Applicant's attention is directed that during the prosecution of a pending patent application the terms found in the claims should be given the broadest reasonable interpretation, *See in re Pearson,* 181 USPQ 641 (CCPA 1974).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. R. Sedighian whose telephone number is (703) 308-9063. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

M. R. Sedighian

Mohammad Sedighian
Patent Examiner
Art Unit : 2633